REMARKS

The claim amendments above do not contain any new matter. Support for the amendments can be found in the application as originally filed. In the table on page 9, it states that $Na_2O + K_2O$ ranges from 12-15 weight percent.

Claims 1-12, 14-16, 18, 19, and 21-25 were pending in the application. Claims 1-12 were withdrawn from consideration. Claims 14-16, 18, 19, and 21-25 were rejected, and claim 19 was objected to.

I. Claim Objection

In the Office Action, claim 19 was objected to for not clearly reciting the alkali oxide limitations. The lower limit of Na_2O was 12 weight percent which was greater than the combined Na_2O and K_2O limitation in claim 19.

In light of the amendment above, the objection of claim 19 is now moot.

II. Claim Rejections

A. Rejection under 35 U.S.C. 112

In the Office Action, claim 18 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Claim 18 was held indefinite for failing to further limit the claim from which it depends- claim 19.

In light of the amendment above, the rejection of claim 18 under 35 U.S.C. 112, second paragraph is no longer relevant.

B. Rejection under 35 U.S.C. 102

1. Rejection under Morimoto

In the Office Action, claims 14-16, 18, 19, and 21-25 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by US Patent No. 5,362,689 ("Morimoto").

a. The Invention

In one embodiment, the present invention is a glass composition. As defined in amended claim 19, the present invention is a glass composition comprising: SiO_2 70 to 75 weight percent; Na_2O 12 to 15 weight percent; K_2O 0 to 5 weight percent; CaO >9 weight percent; MgO < 4 weight percent; Al_2O_3 0 to less than 1.6 weight percent; SO_3 0 to 1 weight percent; Fe_2O_3 0 to less than 0.65 weight percent, wherein $SiO_2 + Al_2O_3 \geq 70$ weight percent, $Na_2O + K_2O$ 12 to 15 weight percent, CaO +MgO 12 to less than 13.4 weight percent, CaO/MgO 2 to 5, wherein the glass composition has a log 2 viscosity in the range of about 2570°F to about 2590°F (1410°C to 1421°C) and a log 4 viscosity in the range of about 1850°F to about 1894°F (1010°C to 1034°C).

In another embodiment, the present invention is a method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO. As defined in amended claim 22, the invention is a method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO comprising the steps of:
increasing the CaO by a selected weight percent; and decreasing the MgO by substantially the same weight percent.

b. The Cited Reference

The Morimoto reference teaches and discloses a green-colored infrared and ultraviolet ray absorbing glass comprising as essential components, on a weight basis, 68-72% of SiO_2, 1.6-3.0% of Al_2O_3, 8.5-11.0% of CaO, 2.0-4.2% of MgO, 12.0-16.0% of Na_2O, 0.5-3.0% of K_2O, 0.08-0.30% of SO_3, 0.58-0.80% of total iron expressed as Fe_2O_3, 0.10-0.60% of CeO_2, 0.10-0.40% of TiO_2 and 5-350 ppm of MnO, with provisos that the total of said essential ingredients amounts to at least 98 wt % of the glass, that the total amount of SiO_2, Al_2O_3 and TiO_2 is from 70.0 to 74.0%, that the total amount CaO and MgO is from 12.0 to 15.0%, that the total amount of Na_2O and K_2O is from 13.0 to 17.0% and that said total iron includes ferrous iron

and ferric iron, the weight ratio of said ferrous iron to said ferric iron, Fe^{2+}/Fe^{3+}, is in the range from 0.40 to 0.70. See claim 1.

c. Traversal of the Rejection

In order for a rejection to be proper under 35 U.S.C. 102, a reference must disclose each and every element of the invention. See, e.g., In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

In one embodiment as described claim 19, the present invention is a glass composition comprising from 0 to less than 1.6 weight percent Al_2O_3 and a ratio of CaO to MgO ranging from 2 to 5. Further, the glass composition of the present invention must have a log 2 viscosity in the range of about 2570°F to about 2590°F (1410°C to 1421°C) and a log 4 viscosity in the range of about 1850°F to about 1894°F (1010°C to 1034°C).

In another embodiment as described in claim 22, the present invention is a method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO comprising the steps of: increasing the CaO by a selected weight percent; and decreasing the MgO by substantially the same weight percent.

In contrast to the glass composition of the present invention, the Morimoto reference teaches and discloses a glass composition containing from 1.6-3.0% of Al_2O_3. Morimoto teaches away from embodiments containing less than 1.6% Al_2O_3. At col. 3, lines 41-43 of Morimoto, it states that if there is less than 1.6% Al_2O_3, glass is not always in good weatherability. In addition, the cited reference does not teach a ratio of CaO to MgO.

In contrast to the method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO of the present invention, the Morimoto reference does not teach or suggest any of the steps used in the invention. Morimoto does not disclose increasing the CaO by a selected weight percent and decreasing the MgO by substantially the same weight percent.

In sum, the Morimoto reference does not teach or disclose the required weight percent of Al_2O_3, the ratio of CaO to MgO, and the required

log 2 and log 4 viscosities of the glass composition of the present invention. Further, Morimoto does not teach or suggest the steps used to lower the melting temperature, forming temperature, and/or liquidus temperature of the present invention. As a result, the rejection of independent claims19 and 22 as being anticipated by Morimoto is improper and should be withdrawn.

Because independent claims 19 and 22 should be allowable in light of the amendments and remarks above, dependent claims 14-16, 18, 21, 23-25 should also be allowable.

2. Rejection under Nakashima

In the Office Action, claims 14-16, 18, 19, 22, 22, 23, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,313,052 ("Nakashima").

a. The Cited Reference

The Nakashima reference teaches and discloses a glass for a substrate, the glass having an average thermal expansion coefficient in a range of from $60x10^{-7}$ to $74x10^{-7}$ /°C at 50 to 350°C and a specific gravity of at most 2.55, wherein the glass consists essentially of the following composition expressed in wt %: SiO_2 from 66.1 to 74; Al_2O_3 from 7.3 to 12.7; MgO from 0 to 9; CaO from 0 to 14; Na_2O from 0 to 12; K_2O from 0 to 10.7; $SiO_2 + Al_2O_3$ from 74 to 82; MgO + CaO from 5 to 24; $Na_2O + K_2O$ from 1 to 12.4; and $MgO + CaO + Na_2O + K_2O$ from 18 to 25.5.

b. Traversal of the Rejection

The arguments made above in regard to the Morimoto reference is applicable here. The Nakashima reference does not teach or disclose the required weight percent of Al_2O_3, the ratio of CaO to MgO, and the required log 2 and log 4 viscosities of the composition according to the present invention. Further, Nakashima does not teach or suggest the steps used to lower the melting temperature, forming temperature, and/or liquidus temperature of the method for lowering the melting temperature, forming temperature, and/or liquidus temperature of the present invention. As a result, the rejection of independent claims19 and 22 as being anticipated by Nakashima is improper and should be withdrawn.

Because independent claims 19 and 22 should be allowable in light of the amendments and remarks above, dependent claims 14-16, 18, 21, 23-25 should also be allowable.

3. Rejection under Seto

In the Office Action, claims 14-16, 18, 19, and 21-25 were rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,998,316 ("Seto").

a. The Cited Reference

The Seto reference teaches and discloses an ultraviolet and infrared radiation absorbing and low transmitting glass comprising, in % by weight: basic glass components comprising 65 to 80% SiO_2, 0 to 5% Al_2O_3, 0 to 10% MgO, 5 to 15% CaO, 5 to 15% MgO+CaO, 10 to 18% Na_2O, 0 to 5% K_2O, 10 to 20% Na_2O+K_2O, and 0 to 5% B_2O_3, and coloring components comprising 0.65 to 0.95% total iron oxide (T-Fe_2O_3) in terms of Fe_2O_3, 0.9 to 2.3% TiO_2, 0 to 2.0% CeO_2, 0.019 to 0.04% CoO, 0 to 0.002% Se, and 0.01 to 0.2% NiO, wherein said glass has a visible light transmission (YA) of 30% or less and a solar energy transmission (TG) of 10 to 35%, when said glass has a thickness of 3.1 to 5 mm.

b. Traversal of the Rejection

The rule for a 35 U.S.C. 102 rejection is stated above. In this case, an embodiment of the present invention as described in claim 19 is a glass composition comprising from 0 to less than 0.65 weight percent Fe_2O_3 and a ratio of CaO to MgO ranging from 2 to 5. Further, the glass composition of the present invention must have a log 2 viscosity in the range of about 2570°F to about 2590°F (1410°C to 1421°C) and a log 4 viscosity in the range of about 1850°F to about 1894°F (1010°C to 1034°C).

In another embodiment of the invention as described in claim 22, the present invention is a method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO comprising the steps of: increasing the CaO by a selected weight percent; and decreasing the MgO by substantially the same weight percent.

In contrast to the glass composition of the present invention, the Seto reference teaches and discloses 0.65 to 0.95% total iron oxide (T-Fe_2O_3) in terms of Fe_2O_3. At col. 4, lines 11 of Seto, it states that when the total iron oxide in terms of Fe_2O_3 is less than 0.65%, ultraviolet and infrared absorption effect is small and therefore desired optical characteristic cannot be obtained. In addition, the cited reference does not teach a ratio of CaO to MgO.

In contrast to the method for lowering the melting temperature, forming temperature, and/or liquidus temperature of a glass composition having CaO and MgO of the present invention, the Seto reference does not teach or suggest any of the steps used in the invention. Seto does not disclose increasing the CaO by a selected weight percent and decreasing the MgO by substantially the same weight percent.

In sum, the Seto reference does not teach or disclose the required weight percent of Fe_2O_3, the ratio of CaO to MgO, and the required log 2 and log 4 viscosities. Further, Seto does not teach or suggest the steps used to lower the melting temperature, forming temperature, and/or liquidus temperature of the present invention. As a result, the rejection of independent claims19 and 22 as being anticipated by Seto is improper and should be withdrawn.

Because independent claims 19 and 22 should be allowable in light of the amendments and remarks above, dependent claims 14-16, 18, 21, 23-25 should also be allowable.

III. Double Patenting Rejection

In the Office Action, claims 14-16, 18, 19, and 21-25 are provisionally rejected under obvious-type double patenting as being unpatentable over claims 17-31 of Application No. 09/974,124.

A. The Cited Reference

The reference teaches and discloses a method of lowering the temperature of glass composition having CaO and MgO for the glass characteristic selected from melting temperature, forming temperature, liquidus temperature and any combinations thereof, comprising the steps of:

a. decreasing the MgO by a selected weight percent, and
b. increasing by substantially the same weight percent at least two of the components selected from CaO, R_2O, Al_2O_3, and SiO_2.

A terminal disclaimer in accordance with 37 CFR 1.321 relating to Application No. 09/974,124 was mailed on March 13, 2003. A copy is attached to this response along with an acknowledgement of receipt from the USPTO. In light of the filed terminal disclaimer, the provisional rejection of claims 14-16, 18, 19, and 21-25 under obvious-type double patenting should be withdrawn.

CONCLUSION

In light of the amendments and remarks presented in this correspondence, the rejections of claim 18 under 35 U.S.C. 112, second paragraph; claims 14-16, 18, 19, and 21-25 under 35 U.S.C. 102(b) as being clearly anticipated by Morimoto; claims 14-16, 18, 19, 22, 22, 23, and 25 under 35 U.S.C. 102(e) as being anticipated by Nakashima; and claims 14-16, 18, 19, and 21-25 under 35 U.S.C. 102(b) as being anticipated by Seto should be withdrawn. In light of the enclosed terminal disclaimer, the provisional rejection of claims 14-16, 18, 19, and 21-25 under obvious-type double patenting as being unpatentable over claims 17-31 of Application No. 09/974,124 should also be withdrawn. Claims 14-16, 18, 19, and 21-25 should be in condition for allowance. If any questions remain about this application, please call me at 412-434-2938. Thank you.

Respectfully submitted,

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